



## Taxonomic notes on three species of the genus *Agonischius* (Coleoptera, Elateridae, Elaterinae, Elaterini) with a new species from Taiwan

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### Abstract

*Agonischius yokoyamai* **sp. nov.** is described and represents the first record of *Agonischius* from Taiwan. This species resembles *A. lateritius* and *A. insolitus*, but is distinguished from the former by an orange body, yellowish-brown setae, longer antennae, and longer female sternite and tergite VIII, and from the latter by a wider body and differences in the male and female terminalia. Mouth-parts, abdominal terminalia and genitalia of this genus are described in detail and illustrated for the first time. These observations reveal that female sternite VIII and tergite VIII may be useful for species identification of *Agonischius*.

**Key words:** Elaterini, *Agonischius yokoyamai* **sp. nov.**, taxonomy, Oriental Region, Taiwan

### Introduction

Candèze (1863) established the genus *Agonischius* to include 26 species from the Oriental region. More than 160 species have been subsequently included in this genus, many of which have been transferred to other genera such as *Agriotes* Eschscholtz, 1829, *Ludioschima* Reitter, 1891, *Vuilletus* Fleutiaux, 1940, and *Chiagosnius* Fleutiaux, 1940 (Fleutiaux, 1940; Platia, 2007, 2008). Platia (2008) revised this genus and provided a key to all known species. He recognized 18 known species, two synonyms and eight new species as true members of *Agonischius* from the Oriental and Australian regions. Platia (2009) described one new species from Sulawesi, Indonesia, which resulted in a total of 27 confirmed species. Ôhira (1966) and Suzuki (1999) transferred five species originally assigned to *Agonischius* from Taiwan to *Ludioschima* (3 spp.), *Vuilletus* (1 sp.) and *Agriotes* (1 sp.). Consequently, there are no records of true *Agonischius* species from Taiwan. Recently, I found an undescribed species of this genus from Taiwan in collections of the Osaka Museum of Natural History and Hokkaido University Museum. This paper represents the first report of true *Agonischius* from Taiwan and describes the new species. Mouth-parts, abdominal terminalia and genitalia of this genus are described in detail and illustrated for the first time. Additionally, the relationship with the closely related species *A. lateritius* Fleutiaux, 1940 and *A. insolitus* Platia, 2008 is discussed by describing and comparing female characters, which have not been previously examined.

### Materials and methods

I examined three species, namely, an undescribed species from Taiwan, *A. lateritius* Fleutiaux, 1940 and *A. insolitus* Platia, 2008. Depositories of specimens examined are as follows: Hokkaido University Museum, Sapporo, Japan (HUM); Muséum National d'histoire Naturelle, Paris, France (MNHN, Edmond Fleutiaux collection); Osaka Museum of Natural History, Osaka, Japan (OMNH, No: 07-13, Hajime Yokoyama collection); personal collection of Kôichi Arimoto and Hisayuki Arimoto, Osaka, Japan (CAR).

Photographs of specimens were captured with a single-lens reflex camera (Canon EOS 70D) mounted on a macro lens (Canon macro photo lens MP-E 65mm), and combined by an image processing software (CombineZM, Alan Hadley).

The morphology of specimens was observed under a stereo microscope (Olympus-SZX9). Measurements are all in millimeters and were made with a micro ruler (MR-2, Kenis Limited, Osaka; minimum scale value: 0.05 mm). The following abbreviations were used: body length (BL), body width (BW), pronotum length including posterior angles (PL), length of the midline of the pronotum (PML), pronotum width including posterior angles (PW), elytra length (EL) and elytra width (EW). Specimens were softened in warm water for dissection. The abdominal terminalia and genitalia were soaked in 10% KOH solution (room temperature, male: 120 min, female: 24 hours). The parts were dehydrated in 99.5% ethanol (5 min), and then mounted in euparal on a microscope slide except for mounting of the bursa copulatrix in water. A transmission microscope (Nikon Y-IDT) with a drawing device was used for observations of the slides and creation of line drawings. Fine pubescence and microtrichia are not represented in the drawings.

Maps were created using a free software (DIVA-GIS 7.5.0.). The digital images of photographs and drawings were edited with an image editing software (Adobe Photoshop 7.0).

## Taxonomy

### Genus *Agonischius* Candèze, 1863

*Agonischius* Candèze, 1863: 407 (original description; type species: *Agonischius pectoralis* Candèze, 1863); Platia, 2008: 2 (general description).

**Diagnosis.** Distinguished from the other genera of the tribe Elaterini by the following combination of characters: the pronotum being without carina; the prosternal process being short, robust and with developed subapical lobe; the body surface being distinctly smooth; the antennal segments being wide.

**Distribution. Oriental Region:** China, India, Nepal, Myanmar, Taiwan (new record), Vietnam, Laos, Thailand, the Philippines (Luzon, Samar Is., Mindanao), Cambodia, Malaysia (the Malay Peninsula, Borneo), Indonesia (Sumatra, Batu Isl., Mentawai Isl., Java). **Australian Region:** Indonesia (Seram Is., Papua), Papua New Guinea (Papua, New Britain Is.).

Although *Agonischius subsericeus* Kolbe, 1886 was reported from South Korea (Cate, 2007), more detailed information is unknown.

### *Agonischius yokoyamai* sp. nov.

(Figures 1–27)

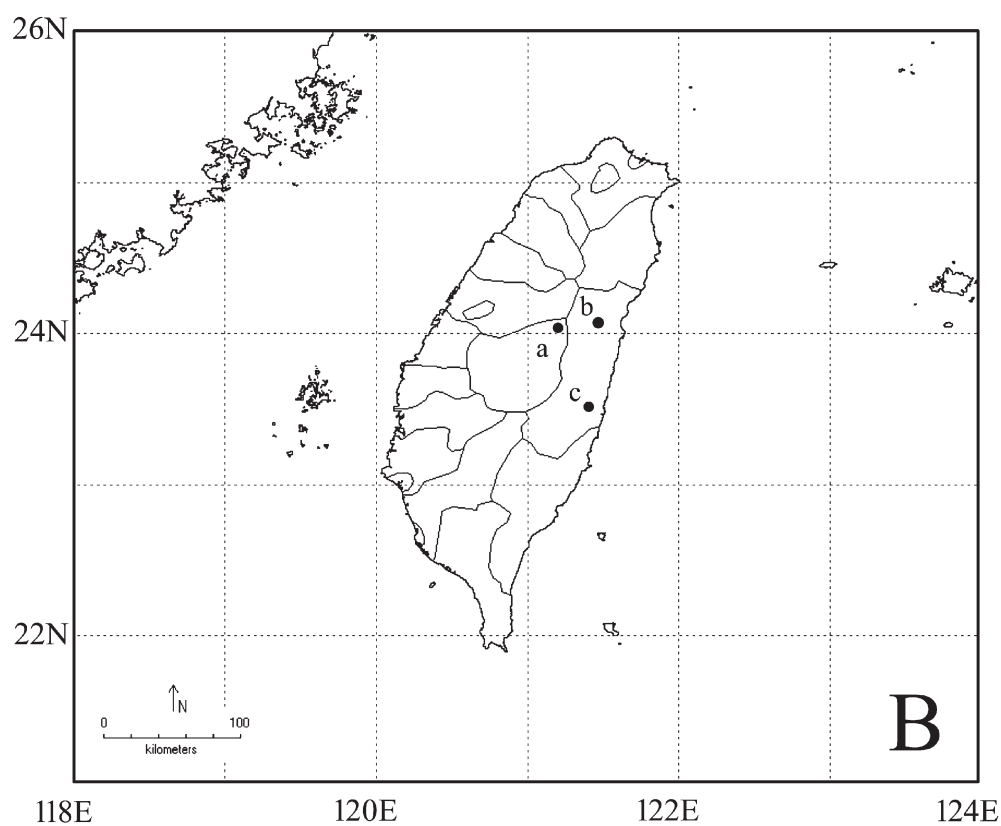
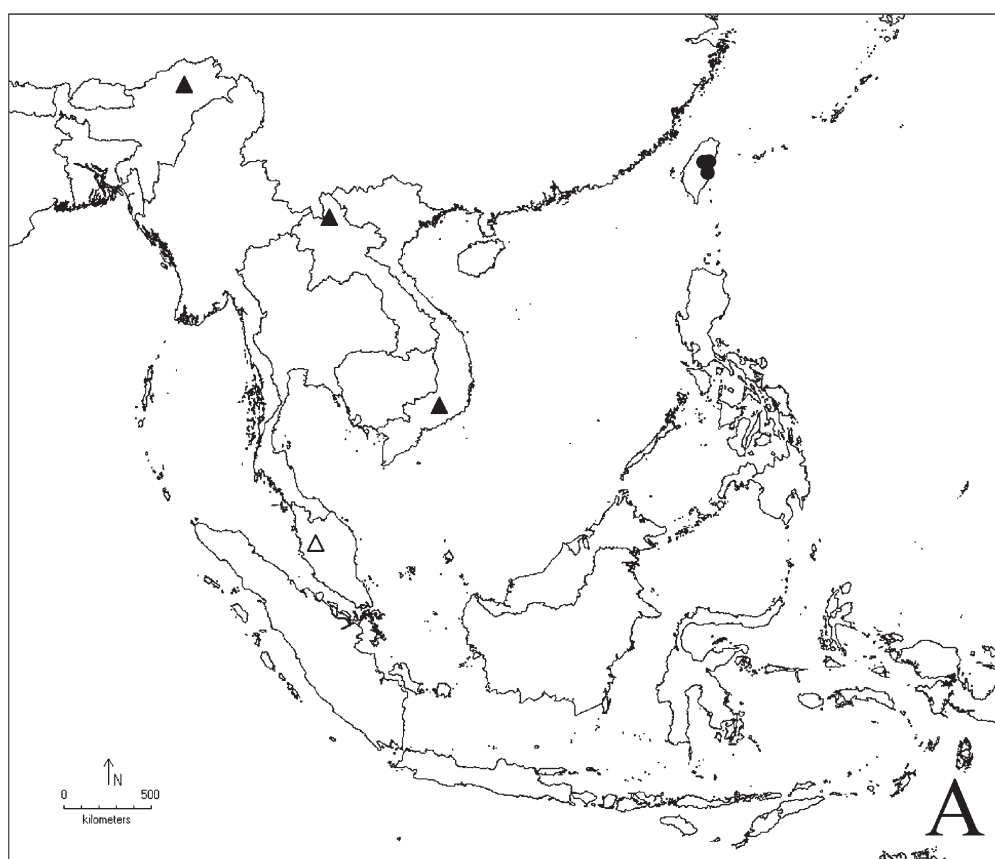
**Type material. Holotype:** male, Meifeng, Renai Township, Nantou County, Taiwan, 14/VI/1974, H. Yokoyama leg. (OMNH). **Paratypes** (14 males, 4 females): 1 male, Ruisui Township, Hualien County, Taiwan, 15/V/1972, H. Yokoyama leg. (OMNH); 8 males, 2 females, same place and collector as the former 15/VI/1972 (OMNH); 4 males, 1 female, same place and collector as the former, 19/VI/1972 (OMNH); 1 male, same place and collector as the former, 20/VI/1972 (OMNH); 1 female, Huitouwan to Tianxiang (about 5 km section on Route 8), 1020–710m, Xiulin Township, Hualien County, Taiwan, 15–16/VIII/1989, M. Ôhara leg. (HUM).

**Distribution** (Fig. 1). Taiwan (Nantou-county, Hualien-county).

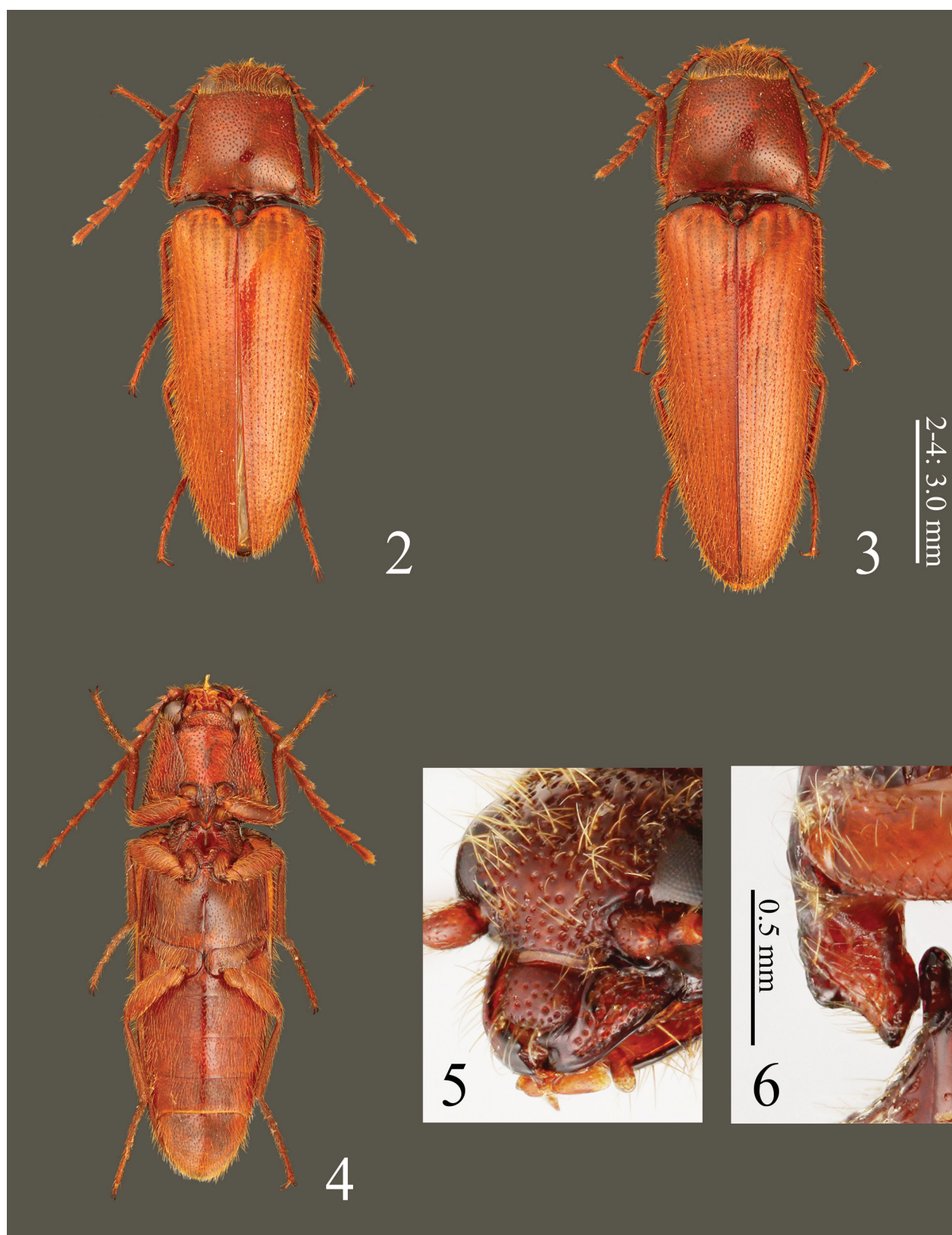
**Description. Adults.** Measurements. Male [holotype]. BL: 9.01–10.5 [10.3], BW: 2.55–3.04 [2.94], PL: 2.24–2.61 [2.43], PML: 1.95–2.31 [2.13], PW: 2.48–3.02 [2.86], PL/PW: 0.850–0.903 [0.850], EL: 6.51–7.56 [7.37], EW: 2.55–3.04 [2.94], EL/EW: 2.49–2.55 [2.51]. Female. BL: 11.3–12.4, BW: 3.17–3.62, PL: 2.83–3.14, PML: 2.44–2.78; PW: 3.11–3.54, PL/PW: 0.887–0.910, EL: 8.02–8.98, EW: 3.17–3.62, EL/EW: 2.48–2.53.

**Body** (Figs. 2, 3) elongate; surface smooth, shining, covered with yellowish brown setae. **Color.** Uniformly dark orang to brown; elytra paler; external margin of mandible, pronotal posterior margin, external margin of scutellum, elytral anterior margin, external margin of prosternum and hypomeron black or nearly black.

**Head** short, convex; frontal margin not carinate, truncated transversely, without nasal plate (Fig. 5); punctures umbilicate and coarse. Labrum (Fig. 7) wide semicircular, with sparse long setae. Antennae long and exceeding apices of pronotal posterior angles by apical three segments in male (Fig. 8), moderate and just reaching apices of posterior angles by apical segment in female (Fig. 9); segment II globular, shortest; segment III conical,

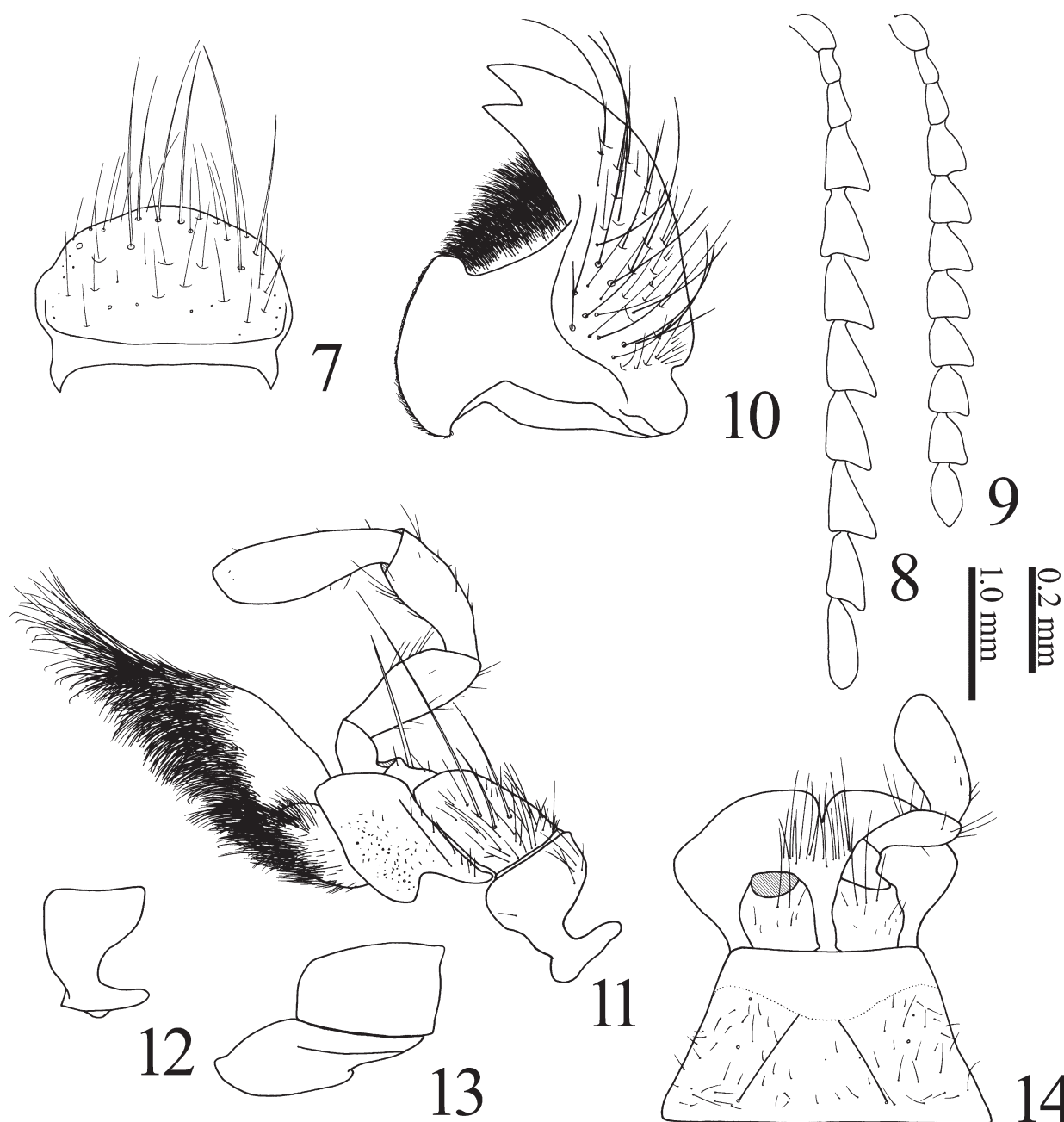


**FIGURE 1.** Collecting localities of *Agonischius* spp. in this study. A. *Agonischius yokoyamai* **sp. nov.** (black circles), *A. lateritius* (black triangles), *A. insolitus* (white triangle). B. Detailed collecting localities of *A. yokoyamai* **sp. nov.** (plots: a; Meifeng, type locality, b; Huitouwan to Tianxiang, c; Ruisui Township).



**FIGURES 2–6.** *Agonischius yokoyamai* **sp. nov.** 2, 4–6. Holotype, male. 3. Paratype, female. 2, 3: dorsal view; 4: ventral view; 5: head, antero-lateral view; 6: prosternal process, lateral view.





**FIGURES 7–14.** *Agonischius yokoyamai* sp. nov. 7, 8, 10–12. Holotype, male. 9. Paratype, female. 7: labrum; 8, 9: antennae; 10: mandible, dorsal view; 11: maxilla, posterior-lateral view; 12: cardo, posterior view; 13: stipes, ventral view; 14: labium. Scales: 1.0mm for 8, 9; 0.2mm for 7, 10–14.

shorter than segment IV; segments IV–X almost same length as each other, long serrate in male, short fan-shaped in female; segment XI longest. Mandibles (Fig. 10) with subapical teeth; penicillum well developed, formed by dense brush of short setae; dorsal sinuous carina well developed; with setae of various lengths on outside of carina. Maxilla (Fig. 11); cardo (Fig. 12) constricted posteriorly; basistipes (Fig. 13) subrectangular, longer than wide, with setae of various lengths, one setae of which distinctly thicker and longer; mediostipes with posterior margin strongly notched, with longitudinal carina, which distinct but not convex, on outside of carina with some short setae, on inside of carina with fine setae; galea long, brush-like; lacinia short, brush-like; apical three segments of palpus elongate; apical segment longest. Labium (Fig. 14); mentum wide trapezoidal, translucent on apical 1/3, with short setae and two long setae on basal 2/3; prementum rounded anterad, with middle anterior notch rather deep, with a transverse row of setae posterior to the notch, fringed with fine setae (not represented in fig. 14); apical palpus segment longest.

**Thorax.** Pronotum wide trapezoidal, widened posterad, convex; sides linear in male (Fig. 2), rounded broadly in female (Fig. 3); posterior angles short, without carina, with rather rough surface; punctures umbilicate and coarse, becoming sparser posterad, smaller around basal margin. Prosternum (Fig. 4) constricted posteriorly, punctures umbilicate and coarse; prosternal lobe slightly exceeding anterior angles of prothorax; prosternal process short, robust, expanded roundly at middle in ventral view, incurved lineally just behind procoxal cavity in lateral view (Fig. 6), with apex rounded in ventral view and sharp in lateral view, with short subapical lobe. Pronotosternal sutures (Fig. 4) closed frontally, not grooved, smooth band-like. Hypomeron (Fig. 4) with umbilicate and coarse punctures, which distinctly larger than prosternal punctures. Mesosternum distinctly higher than metasternum at border of them. Mesepimeron reaching mesocoxal cavity. Scutellum elongate shield-shaped, widest at apical 1/3, strongly rounded anterad, with sharp apex; almost flat; inclined anterior downwards; punctures small. Metasternum (Fig. 4) with shallow median longitudinal groove. Metacoxal plates (Fig. 4) narrowed abruptly laterad. Elytra (Figs. 2, 3) long, broadly convex; sides almost parallel on basal half, then roundly convergent towards apices; striae not grooved, but defined by distinct punctures; intervals with small punctures. Legs; tibial spurs well developed; tarsi and claws simple.

**Abdomen.** Sternite VII wide semicircular (length/width= ca. 0.75). **Male.** Tergite VIII (Fig. 15) long semicircular (length/width= ca. 1.2), widest at basal 1/3; slightly translucent in median basal area; posterior margin fringed with setae of various lengths. Sternite VIII (Fig. 16) wide sub-trapezoidal; posterior margin incurved shallowly at middle, with broadly rounded angles, which fringed with some setae of various lengths; anterior margin fringed with wide yellowish band limit of which indefinite. Tergite IX (Fig. 17) slightly longer than wide; middle posterior notch deep and sharp; posterior angles with few setae. Tergite X (Fig. 17) longer than wide; with a few short setae. Sternite IX (Fig. 18) long, slightly widened posterad; posterior half covered with short setae and fringed with long setae. **Female.** Tergite VIII (Fig. 22) long shield-shaped (length/width = ca. 1.5), widest at basal 2/5; apical margin strongly prominent, with dense and fine setae (not represented in fig. 22); apical 3/5 with dense numerous microtrichia (not represented in fig. 22) and fringed with setae of various lengths. Sternite VIII (Fig. 23) coalesced tergite VIII at a part of lateral margin; basal area membranous, with definite limit between sclerotized area; sclerotized area longer than wide (length/width = ca. 1.2), with setae longer and denser apicad; speculum (Fig. 24) elongate, attached to sclerotized area of sternite VIII (Fig. 23).

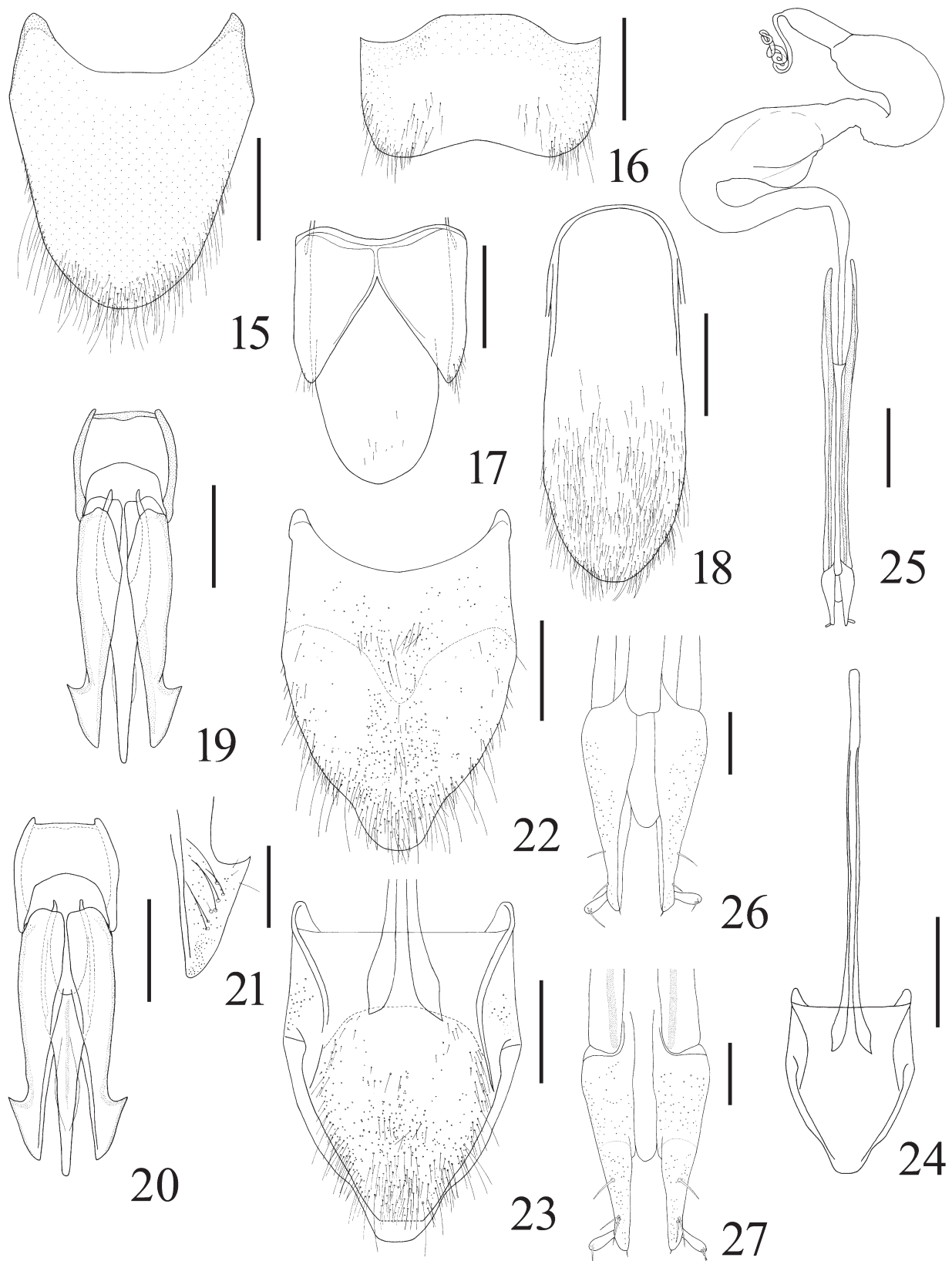
**Genitalia. Male.** Aedeagus (Figs. 19, 20) elongate; median lobe longer than parameres; basal struts exceeding basal margin of parameres; parameres separate; apical portion of parameres long triangular, without setae in dorsal view and some long setae in ventral view (Fig. 21). **Female.** Ovipositor (Fig. 25) elongate; coxites (Figs. 26, 27) with indefinite limit of two segments in ventral view; each coxite with two setae in dorsal view, with three setae in ventral view, with a short seta at apex; stylus with few setae near apex; vagina long, with two dome-shaped bulges; bursa copulatrix (Fig. 25) thick and long, without sclerotized pieces; spermatheca (Fig. 25) attached to apex of bursa copulatrix, coiled.

**Larvae & Pupae.** Unknown.

**Diagnosis.** This species is similar to *A. lateritius* Fleutiaux, 1940, which is distributed from India to China, but distinguished by the combination of the following characteristics: the lighter orange body (Figs. 2, 3), elytra suture not black or black-like, yellowish-brown setae, longer antennae (Figs. 8, 9), and female tergite VIII and sternite VIII being longer (Figs. 22, 23). This species is also similar to *A. insolitus* Platia, 2008 from Malaysia, but distinctly different with a wider body, larger and denser pronotal punctures, elongate scutellum, long triangular apical portion of parameres of male aedeagus (Figs. 19–21), sclerotized area of female sternite VIII being short (Figs. 23) and female bursa copulatrix being long and without sclerotized pieces (Fig. 25).

**Etymology.** Dedicated to Mr. Hajime Yokoyama, the collector of specimens examined.

**Bionomics.** There is no information concerning the life history of this species. Some *Agonischius* species and other species of related genera are usually collected by sweeping the flowers of trees, because I suppose the long brush-like galea (Fig. 11) of this species is useful for feeding on the pollen of flowers. Continuous observation is needed to determine their habits.

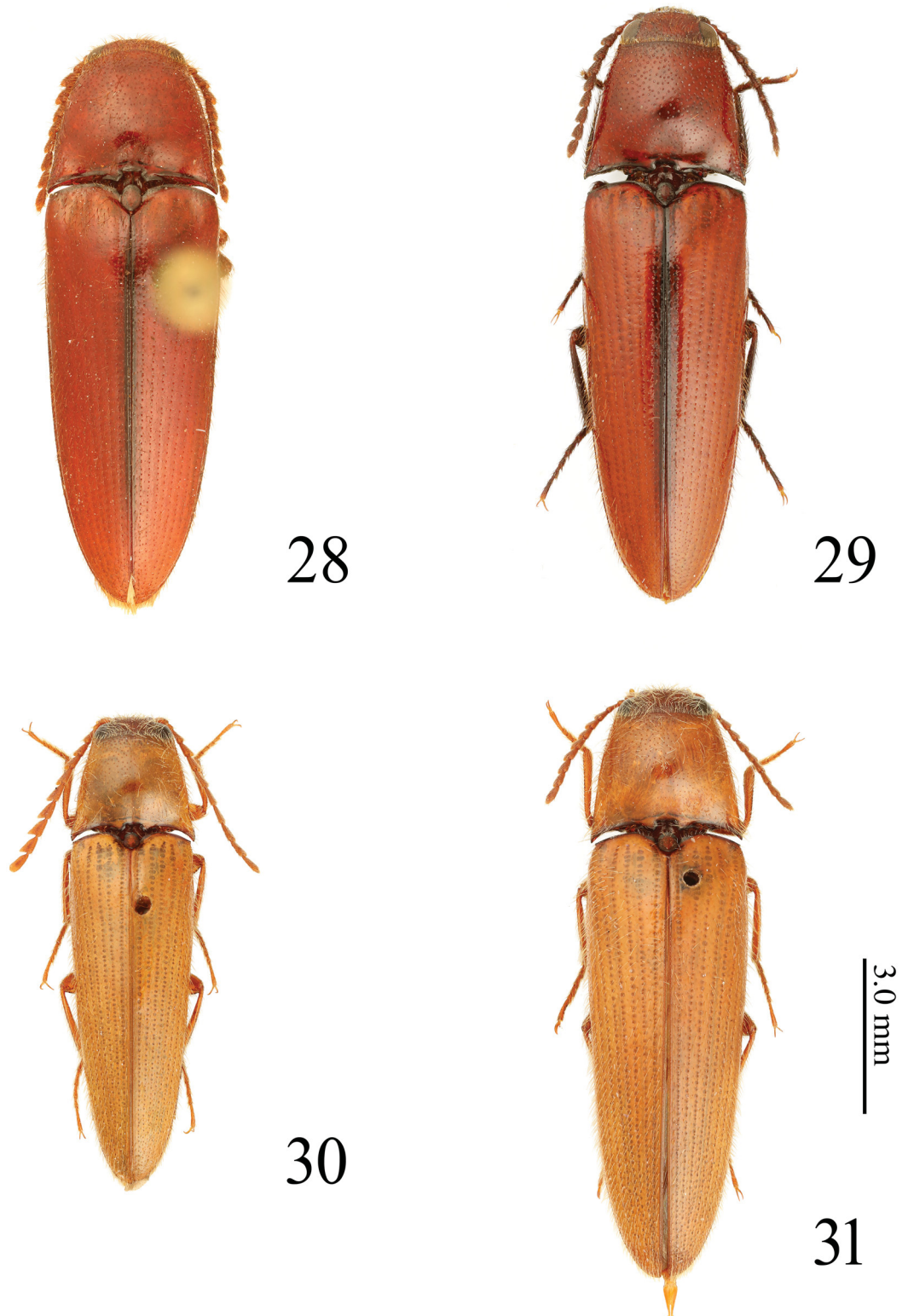


**FIGURES 15–27.** *Agonischius yokoyamai* sp. nov. 15–21. Holotype, male. 22–27. Paratype, female. 15: tergite VIII; 16: sternite VIII; 17: tergites IX–X; 18: sternite IX; 19: aedeagus, dorsal view; 20: ditto, ventral view; 21: ditto, apical portion, ventral view; 22: tergite VIII; 23, 24: sternite VIII; 25: genitalia, dorsal view; 26: apex of ovipositor, dorsal view; 27: ditto, ventral view. Scales: 0.2mm for 21, 26, 27; 0.5mm for the others.

***Agonischius lateritius* Fleutiaux, 1940**

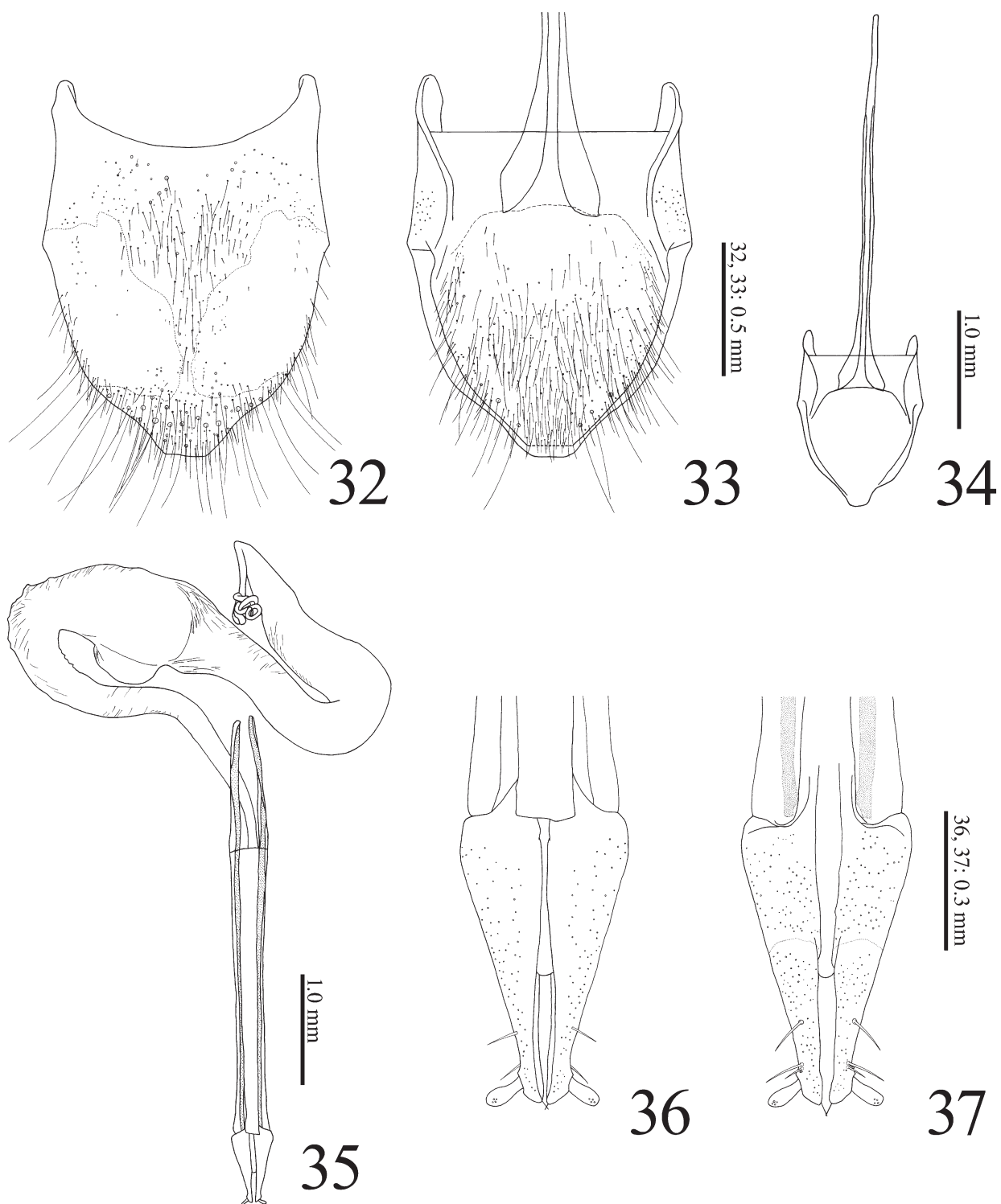
(Figures 1, 28, 29, 32–37)

*Agonischius lateritius* Fleutiaux, 1940: 122 (original description; type locality: Sen Kam, Laos; key to *Agonischius* species from Indochina region); Platia, 2008: 6 (redescription), 12 (key to the known species of *Agonischius*), 22 (photo of male aedeagus), 25 (photo of habitus); Platia, 2009: 43 (new record from China).



**FIGURES 28–31.** *Agonischius* spp., dorsal view. 28: *A. lateritius*, holotype, male; 29: ditto, female; 30: *A. insolitus*, male; 31: ditto, female.





**FIGURES 32–37.** *Agonischius lateritius*, female. 32: tergite VIII; 33, 34: sternite VIII; 35: genitalia, dorsal view; 36: apex of ovipositor, dorsal view; 37: ditto, ventral view.

**Type material. Holotype:** Male (Fig. 28), Sen Kam, Laos, 29/V/1918, R. Vitalis de Salvaza leg. (MNHN).

**Non type materials.** 2 female (Fig. 29), Bao Loc, Lam Dong Province, Vietnam, IV/2004, by the native (CAR); 1 female, West Siang District, Arunachal Pradesh State, India, 4/VII/2011, T. Maeda leg. (CAR).

**Distribution** (Fig. 1). India, Nepal, Myanmar, China (Guangxi Zhuang Autonomous Region), Laos, Vietnam, Thailand.

**Additional description. Adults.** Measurements. Male, holotype. BL: 11.5, BW: 3.42, PL: 2.92, PML: 2.56, PW: 3.27, PL/PW: 0.893, EL: 8.30, EW: 3.42, EL/EW: 2.43. Female. BL: 10.3–11.2, BW: 2.88–3.18, PL: 2.42–2.69, PML: 2.12–2.33, PW: 2.88–3.12, PL/PW: 0.840–0.862, EL: 7.35–7.97, EW: 2.87–3.18, EL/EW: 2.51–2.56.

**Female.** Tergite VIII (Fig. 32) long shield-shaped (length/width = ca. 1.3), widest at basal 9/20; apical margin prominent, with dense and fine setae (not represented in fig. 32); apical 7/20 to 17/20 area with dense numerous microtrichia except longitudinal median area with setae of various lengths; apical half margin fringed with setae of various lengths. Sternite VIII (Fig. 33) coalesced tergite VIII at part of lateral margin; basal area membranous, with definite limit between sclerotized area; sclerotized area almost as long as wide, with setae longer and denser apicad; speculum elongate, attached to sclerotized area of sternite VIII (Fig. 34).

**Genitalia.** Ovipositor (Fig. 35) long; coxites (Figs. 36, 37) with indefinite limit of two segments in ventral view; each coxite with two setae in dorsal view, with three setae in ventral view, with a short seta at apex; stylus without distinct pubescence (probably lost due to bad condition); vagina long, with a two dome-shaped bulges; bursa copulatrix (Fig. 35) thick and long, without sclerotized piece; spermatheca (Fig. 35) attached to apex of bursa copulatrix, coiled.

**Remarks.** I determined a type specimen as the holotype because only one specimen was recorded in the original description and I could find one type specimen in the Fleutiaux collection of the Muséum National d'histoire Naturelle, Paris.

This species exhibits sexual dimorphism regarding antennae. The male possesses long antennae extending to the apices of the pronotal posterior angles by the apical segments, whereas the female possesses short antennae that do not extend to the apices of pronotal posterior angles by the apical segments. I determined that the holotype is male by comparing the lengths of antennae of specimens examined, although the sex of the holotype was not assigned in the original description.

### ***Agonischius insolitus* Platia, 2008**

(Figures 1, 30, 31, 38–44)

*Agonischius insolitus* Platia, 2008: 11 (original description; type locality: Cameron Highland, Malaysia), 12 (key to the known species of *Agonischius*), 22 (photo of male aedeagus), 23 (photo of male antenna), 25 (photo of habitus).

**Type material.** Not examined.

**Non type materials.** 1 male (Fig. 30), Cameron Highlands, Pahang, Malaysia, 4,800 feet (ca. 1460 m), 13/III/1924, H. M. Pendlebury leg., at light (MNHN); 1 female (Fig. 31), Tanah Rata, Cameron Highlands, Pahang, Malaysia, 4,800 feet (ca. 1460 m), 11/III/1925, H. M. Pendlebury leg., at light (MNHN).

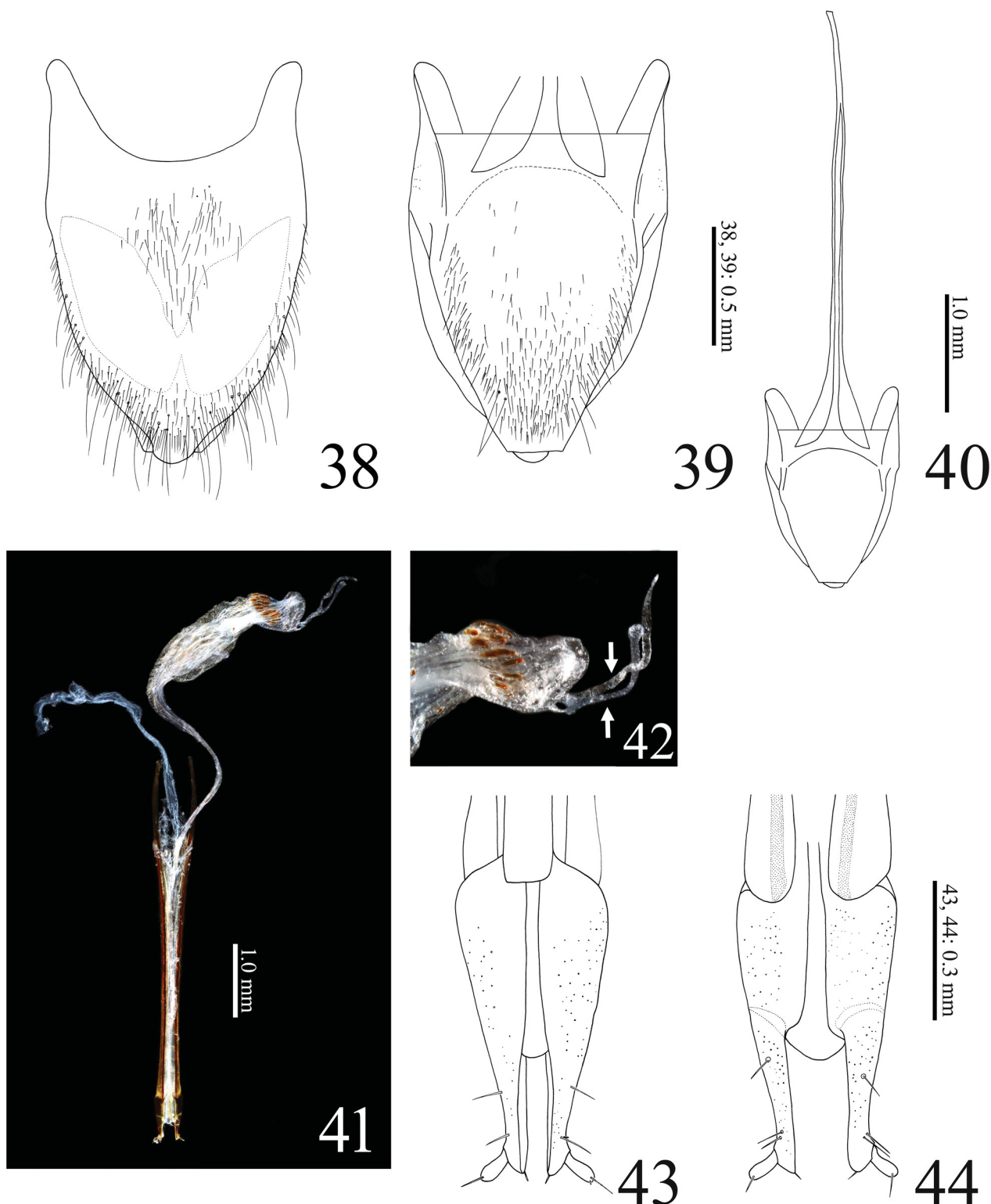
**Distribution** (Fig. 1). Malaysia (the Malay Peninsula: Cameron Highlands).

**Additional description. Adults.** Measurements. Male. BL: 8.99, BW: 2.40, PL: 2.05, PML: 1.72, PW: 2.40, PL/PW: 0.854, EL: 6.76, EW: 2.38, EL/EW: 2.84. Female. BL: 11.4, BW: 3.10, PL: 2.45, PML: 2.08, PW: 2.93, PL/PW: 0.836, EL: 8.59, EW: 3.10, EL/EW: 2.77.

**Female.** Tergite VIII (Fig. 38) long shield-shaped (length/width = ca. 1.5), widest at basal 2/5; apical margin strongly and narrowly prominent, with dense and fine setae (not represented in fig. 38); apical 1/6 to 3/5 area with dense numerous microtrichia except longitudinal median area with setae of various lengths; apical 3/5 margin fringed with setae of various lengths. Sternite VIII (Fig. 39) coalesced tergite VIII at a part of lateral margin; basal area membranous, with definite limit between sclerotized area; sclerotized area longer than wide (length/width = ca. 1.4), with setae longer and denser apicad; speculum (Fig. 40) elongate, attached to basal membranous area of sternite VIII (Fig. 39).

**Genitalia.** Ovipositor (Fig. 41) long; coxites (Figs. 43, 44) with indefinite limit of two segments in ventral view, each coxite with two moderate setae in dorsal view, with three moderate setae in ventral view, with a short seta at apex; stylus with some setae near apex; vagina long, with dome-shaped bulges; bursa copulatrix (Fig. 41), shape obscure because it was busted, rather short, with many small sclerotized pieces (Fig. 42); two spermathecae (Fig. 42, arrow) attached to apical part of bursa copulatrix.

**Remarks.** These specimens represent the second record of this species. This species were collected only from around Cameron Highland, Malaysia until now.



**FIGURES 38–44.** *Agonischius insolitus*, female. 38: tergite VIII; 39, 40: sternite VIII; 41: genitalia, dorsal view; 42: bursa copulatrix and spermathecae; 43: apex of ovipositor, dorsal view; 44: ditto, ventral view.

**Bionomics.** Paratype and specimens examined in this study of this species were collected while attracted to lights (Platia, 2008). This behavior may be very rare for this genus. Some *Agonischius* species and other species of related genera are usually collected by sweeping the flowers of trees.

## Discussion

**The tribe Elaterini of Taiwan.** Schimmel & Tarnawski (2010) transferred *Parallelostethus thoracicus* (Fleutiaux, 1918) to *Elater* Linneaus, 1758, using reports only from Vietnam and China. This species had been recorded from Taiwan under the name *Elater (Parallelostethus) thoracicus* (Fleutiaux, 1918) (Kishii, 1985, 1991). Additionally, Schimmel & Tarnawski (2010) included *Nipponoelater sieboldi* (Candèze, 1873) within the Taiwanese fauna; however, this species is restricted to the mainland of Japan (except the Ryukyus) and was removed from Taiwan by Suzuki (1999). On the basis of these findings, Taiwanese Elaterini includes 20 species comprising eight genera, namely, *Elater* Linneaus, 1758 (1 sp.), *Sericus* Eschscholtz, 1829 (1 sp.), *Agonischius* (1 sp.), *Mulsanteus* Gozis, 1875 (4 spp.), *Ludioschima* (7 spp.), *Vuilletus* (3 spp.), *Nipponoelater* Kishii, 1985 (2 spp.) and *Taiwanostethus* Kishii, 1994 (1 sp.). In addition to these species, Suzuki (1999) reported many unidentified species of the tribe, but none have been described as yet.

**Morphology.** *Agonischius yokoyamai* sp. nov., *A. insolitus* Platia, 2008 and *A. lateritius* Fleutiaux, 1940 are suggested to be closely related species because they share a red to orange unicolor body (Figs. 2, 3, 28–31), a large body size for this genus (male: 8.99–11.5 mm, female: 10.3–12.4 mm), each antennal segment relatively elongate (Figs. 8, 9), similar shaped prosternal process (Fig. 6), and a mesosternum that is distinctly higher than the metasternum (Fig. 4). *Agonischius yokoyamai* is most similar superficially to *A. insolitus* due to the orange body and long male antennae, which distinctly extend beyond the apices of the pronotal posterior angles. However, they differ completely regarding genitalia. The former species exhibits a long triangular apical portion of the parameres of the male aedeagus (Figs. 19–21) and a female bursa copulatrix with one spermatheca and without a sclerotized piece (Fig. 25), whereas the latter species exhibits a rounded apical portion of the parameres of the aedeagus (Platia, 2008) and a bursa copulatrix with two spermathecae and many sclerotized pieces (Fig. 42). The male genitalia of *A. lateritius* are similar to those of *A. yokoyamai*. There are other similarities between the two species, such as a robust body (*A. yokoyamai*, EL/EW: 2.43–2.56; *A. insolitus*, EL/ EW: 2.77–2.84), elongate scutellum, and a long bursa copulatrix (Figs. 25, 35). It is therefore suggested they are the most closely related species. The females are especially similar, and their most distinct diagnostic characters are the states of tergite VIII and sternite VIII (Figs. 22, 23, 32, 33), excluding the coloration of body and setae (Fig. 2, 3, 28, 29). These characters may be useful in an identification key for other congeners because the characters are also effective in distinguishing *A. yokoyamai* and *A. insolitus*. Future studies involving the phylogeny of the genus are important to better understand the evolutionary relationships of this group.

The following nine *Agonischius* species are known only from a female: *A. mirus* Candèze, 1863, *A. brevicollis* Candèze, 1874, *A. fusiformis* Candèze, 1875, *A. ornatus* Candèze, 1880, *A. militaris* Candèze, 1882, *A. sternalis* Candèze, 1893, *A. carinatus* Platia, 2008, *A. cordiformis* Platia, 2008, *A. magnificus* Platia, 2008. These species are distinguished mainly by body color and the pattern of the markings of the pronotum and elytra (Platia, 2008). Although coloration is a strong diagnostic character for this genus, there are small differences of the coloration between closely related species. Additionally, I found many undescribed species of this genus, and the relationships between species of this genus become more complicated. In the future, the key in Platia (2008) should be updated including not only differences of the coloration but the female terminalia because of the stability for specific identification.

## Acknowledgements

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